



DESCRIPTION

The IS283 optocoupler consists of a GaAs infrared emitting diode optically coupled to an NPN silicon photo transistor.

This device belongs to isocom Compact Range of Optocouplers.

FEATURES

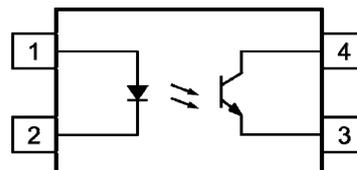
- Low Input Current
- Half Pitch 1.27mm
- CTR guaranteed min 50% at I_F 0.5mA, V_{CE} 5V
- Wide Operating Temperature Range - 55°C to +125°C
- High AC Isolation voltage 3750V_{RMS}
- Lead Free and RoHS Compliant
- Safety Approvals Pending

APPLICATIONS

- Computer Terminals
- Industrial System Controllers
- Measuring Instruments
- Signal Transmission between Systems of Differential Potentials and Impedances

ORDER INFORMATION

- Available in Tape and Reel with 3000 pieces per reel



- 1 Anode
- 2 Cathode
- 3 Emitter
- 4 Collector

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

Stresses exceeding the absolute maximum ratings can cause permanent damage to the device. Exposure to absolute maximum ratings for long periods of time can adversely affect reliability.

Input

| | |
|----------------------|--------|
| Forward Current | 50mA |
| Reverse Voltage | 6V |
| Junction Temperature | 125 °C |

Output

| | |
|--|--------|
| Collector to Emitter Voltage V_{CEO} | 80V |
| Emitter to Collector Voltage V_{ECO} | 7V |
| Collector Current | 50mA |
| Power Dissipation | 150mW |
| Junction Temperature | 125 °C |

Total Package

| | |
|----------------------------------|----------------------|
| Isolation Voltage | 3750V _{RMS} |
| Total Power Dissipation | 200mW |
| Operating Temperature | -55 to 125 °C |
| Storage Temperature | -55 to 125 °C |
| Lead Soldering Temperature (10s) | 260°C |

ISOCOM COMPONENTS 2004 LTD

Unit 25B, Park View Road West, Park View Industrial Estate
 Hartlepool, Cleveland, TS25 1PE, United Kingdom
 Tel : +44 (0)1429 863 609 Fax : +44 (0)1429 863 581
 e-mail : sales@isocom.co.uk
<http://www.isocom.com>

ISOCOM COMPONENTS ASIA LTD

Hong Kong Office
 Block A, 8/F, Wah Hing Industrial Mansions
 36 Tai Yau Street, San Po Kong, Kowloon, Hong Kong
 Tel : +852 2995 9217 Fax : +852 8161 6292
 e-mail : sales@isocom.com.hk



IS283

ELECTRICAL CHARACTERISTICS (T_A = 25°C, unless otherwise specified. Typical Values at T_A = 25°C)

INPUT

| Parameter | Symbol | Test Condition | Min | Typ. | Max | Unit |
|----------------------|-----------------|-----------------------|-----|------|-----|------|
| Forward Voltage | V _F | I _F = 10mA | | | 1.6 | V |
| Reverse Current | I _R | V _R = 5V | | | 5 | μA |
| Terminal Capacitance | C _{IN} | V = 0V, f = 1KHz | | 30 | 250 | pF |

OUTPUT

| Parameter | Symbol | Test Condition | Min | Typ. | Max | Unit |
|-------------------------------------|------------------|--|-----|------|-----|------|
| Collector-Emitter Breakdown Voltage | V _{CEO} | I _C = 0.5mA, I _F = 0mA | 80 | | | V |
| Emitter-Collector Breakdown Voltage | V _{ECO} | I _E = 0.1mA, I _F = 0mA | 7 | | | V |
| Collector Dark Current | I _{CEO} | V _{CE} = 48V, I _F = 0mA | | 10 | 80 | nA |

COUPLED

| Parameter | Symbol | Test Condition | Min | Typ. | Max | Unit |
|--------------------------------------|----------------------|--|-----|------|-----|------|
| Current Transfer Ratio | CTR | I _F = 0.5mA, V _{CE} = 5V | 50 | | | % |
| | | I _F = 5mA, V _{CE} = 5V | | | | |
| Collector-Emitter Saturation Voltage | V _{CE(sat)} | I _F = 8mA, I _C = 2.4mA | | | 0.3 | V |
| Floating Capacitance | C _f | V = 0V, f = 1MHz | | 0.6 | 1 | pF |
| Rise Time | t _r | V _{CC} = 10V, I _C = 2mA, R _L = 100Ω, f = 100Hz | | 2 | 18 | μs |
| Fall Time | t _f | | | 3 | 18 | |

ISOLATION

| Parameter | Symbol | Test Condition | Min | Typ. | Max | Unit |
|---------------------------|------------------|---|----------------------|----------------------|-----|------------------|
| Isolation Voltage | V _{ISO} | R.H. = 40% to 60 %, t = 1 min | 3750 | | | V _{RMS} |
| Input - Output Resistance | R _{I-O} | V _{I-O} = 500VDC, R.H. = 40% to 60 %, | 5 x 10 ¹⁰ | 1 x 10 ¹¹ | | Ω |

Device is considered a two terminal device : pins 1 and 2 are shorted together and pins 3 and 4 are shorted together.

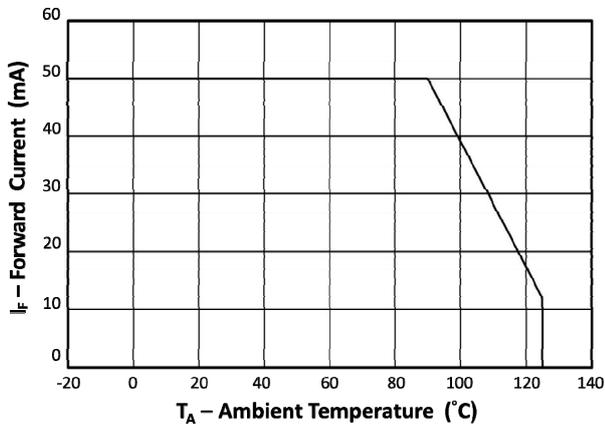


Fig 1 Forward Current vs Ambient Temperature

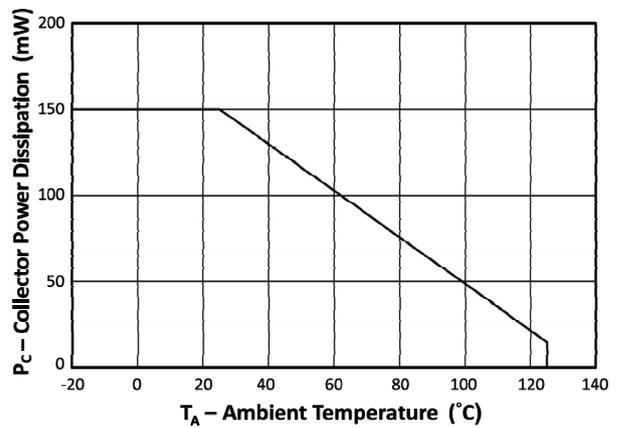


Fig 2 Collector Power vs Ambient Temperature

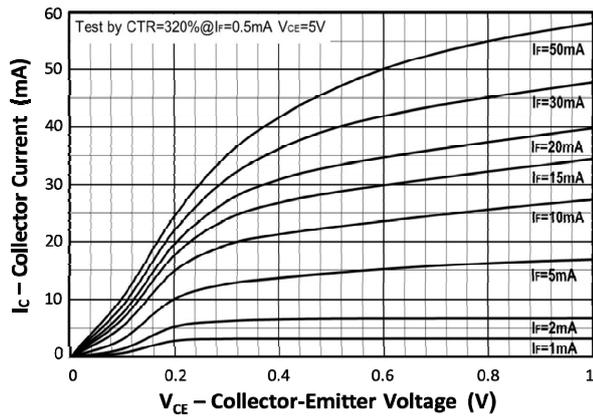


Fig 3 Collector Current vs Collector-Emitter Voltage

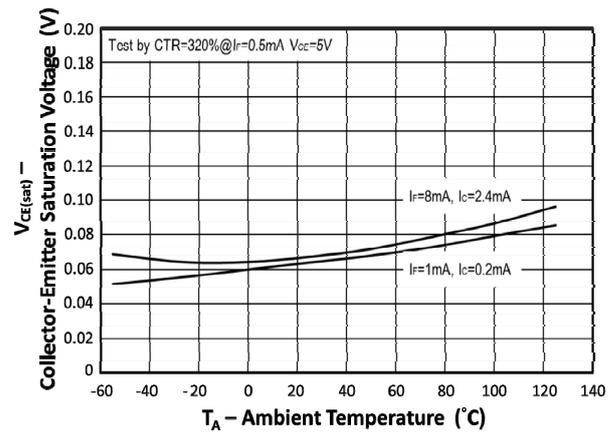


Fig 4 Collector-Emitter Saturation Voltage vs Ambient temperature

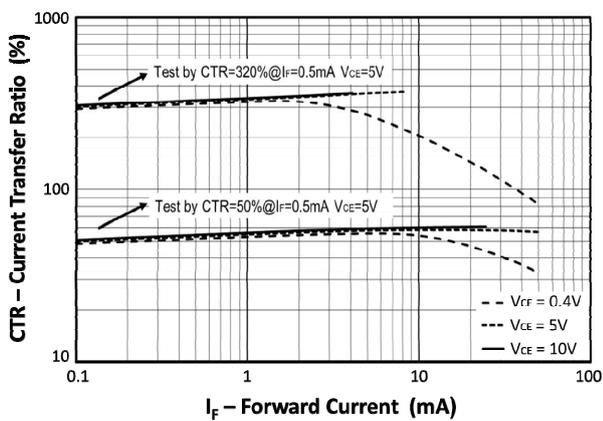


Fig 5 Current Transfer Ratio vs Forward Current

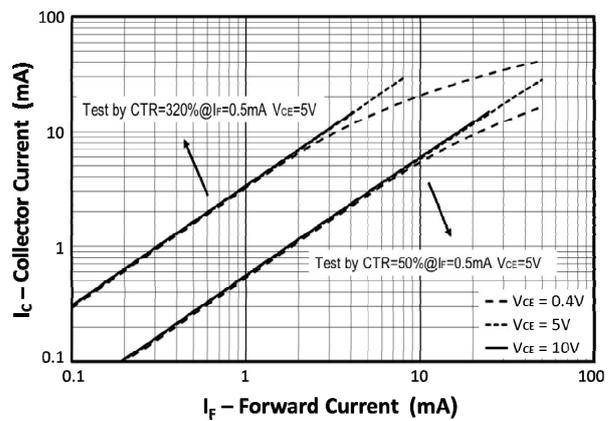


Fig 6 Collector Current vs Forward Current

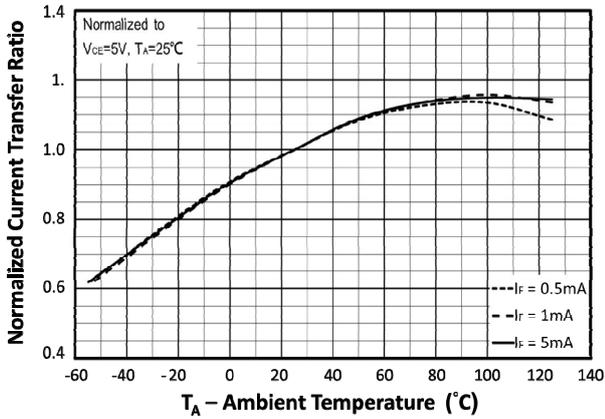


Fig 7 Normalized Current Transfer Ratio vs Ambient Temperature

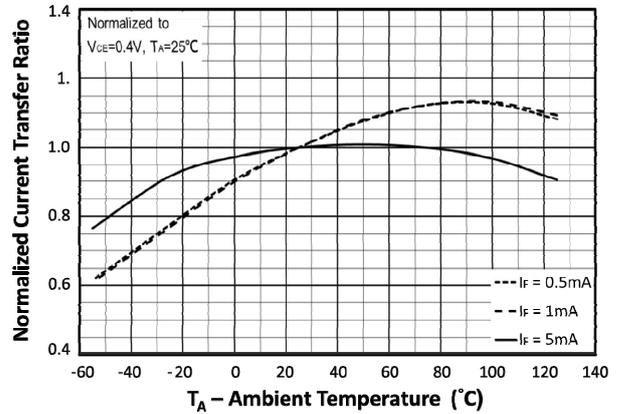


Fig 8 Normalized Saturated Current Transfer Ratio vs Ambient Temperature

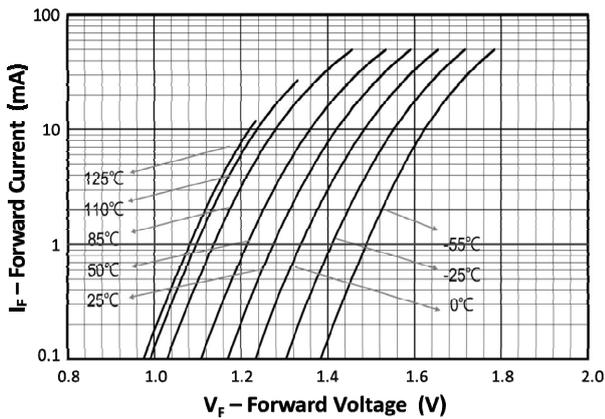


Fig 9 Forward Current vs Forward Voltage

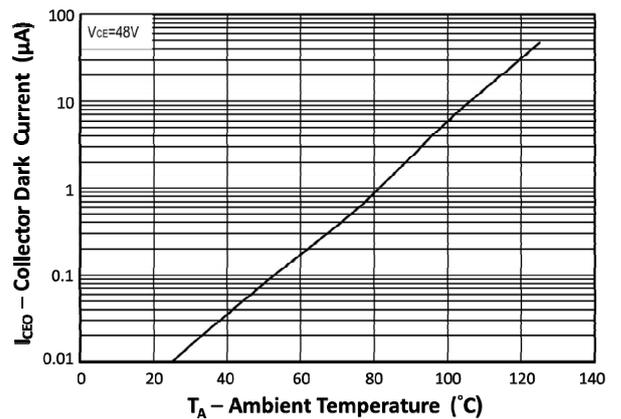


Fig 10 Collector Dark Current vs Ambient temperature

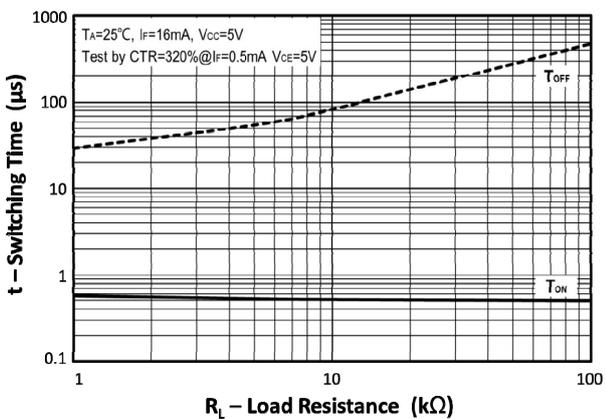


Fig 11 Response Time vs Load Resistance

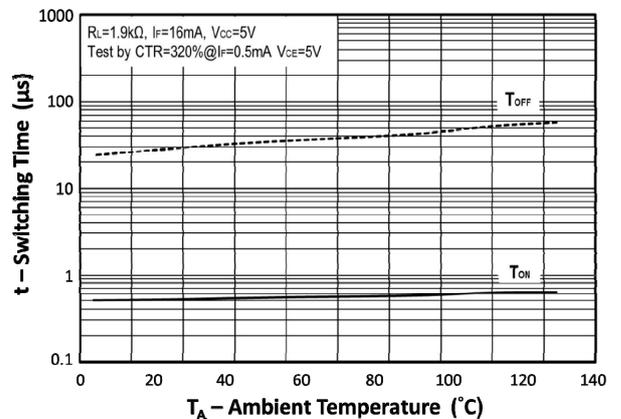
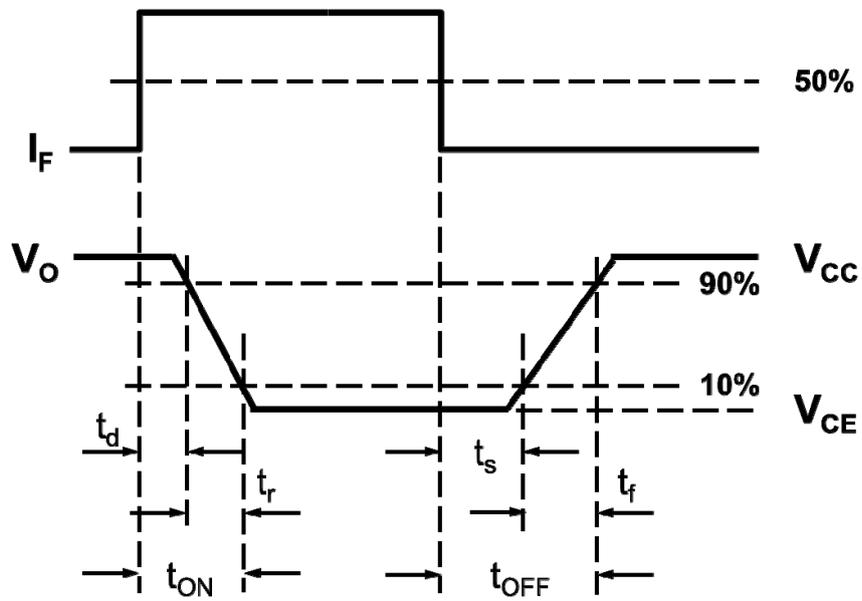
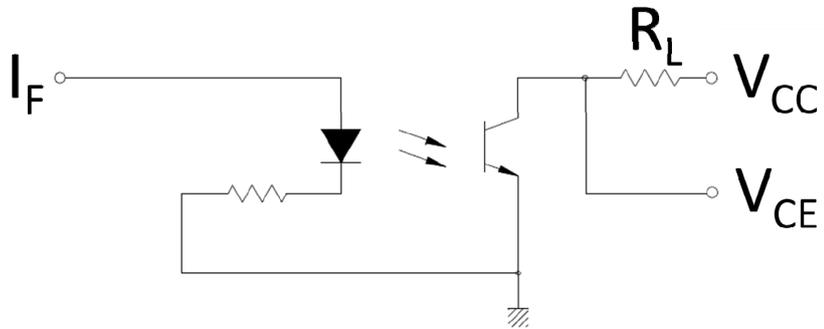


Fig 12 Response Time vs Ambient Temperature



Switching Time Test Circuit and Waveform

IS283

ORDER INFORMATION

| IS283 | | | |
|----------|-------|-----------------------------|-------------------|
| After PN | PN | Description | Packing quantity |
| None | IS283 | Surface Mount Tape and Reel | 3000 pcs per reel |

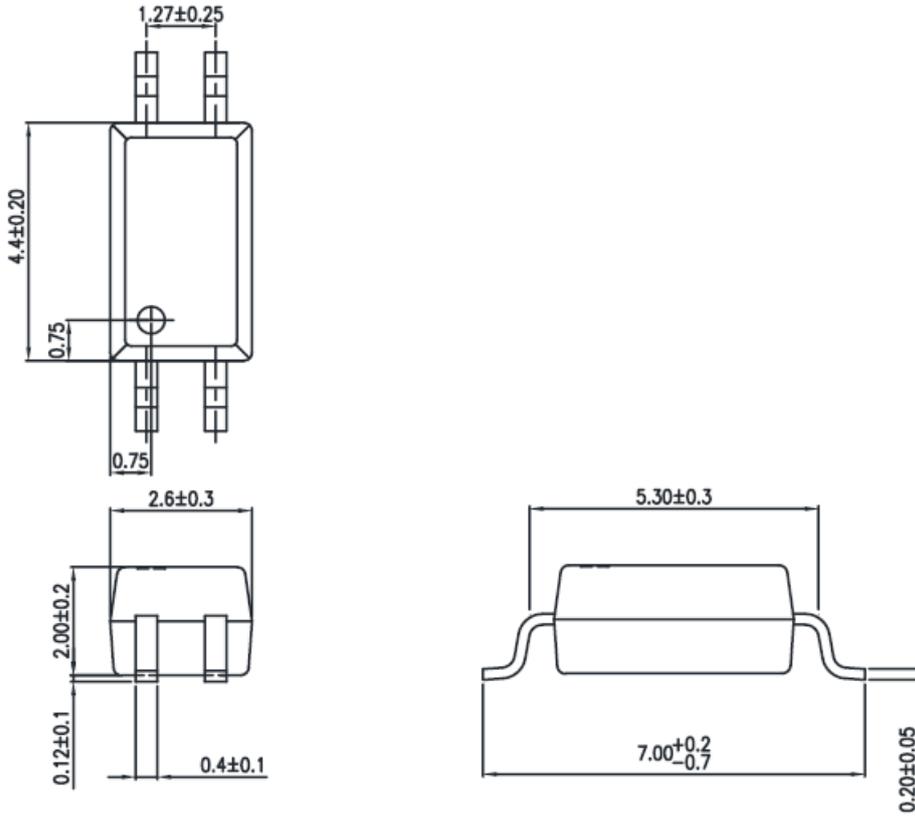
DEVICE MARKING



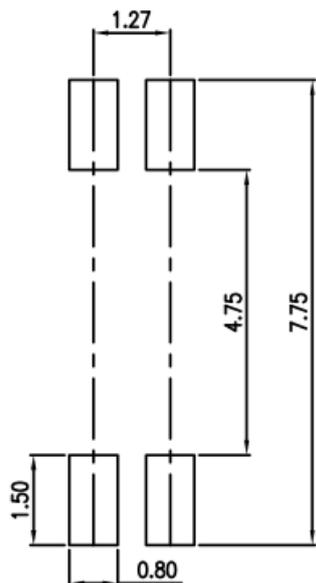
- IS283 denotes Device Part Number
- / denotes Isocom
- Y denotes 1 digit Year code (A = 2010, B = 2011, etc.)
- WW denotes 2 digit Week code

IS283

PACKAGE DIMENSIONS in mm



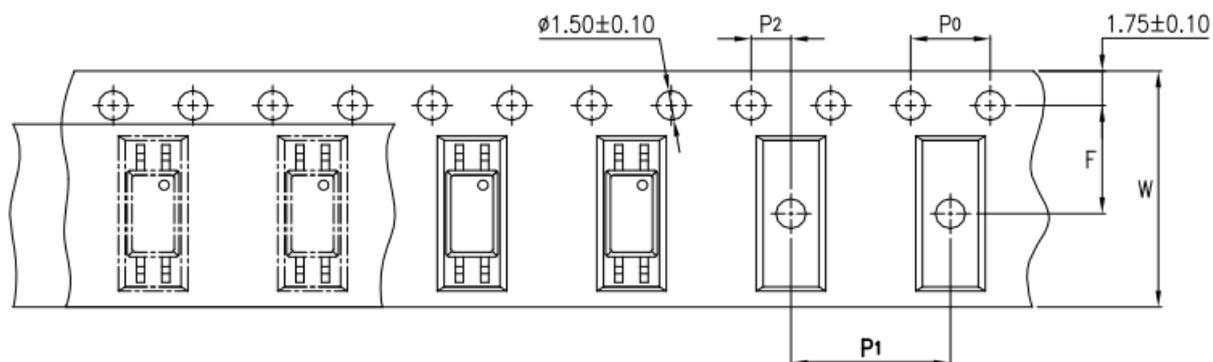
RECOMMENDED PAD LAYOUT FOR SMD (mm)





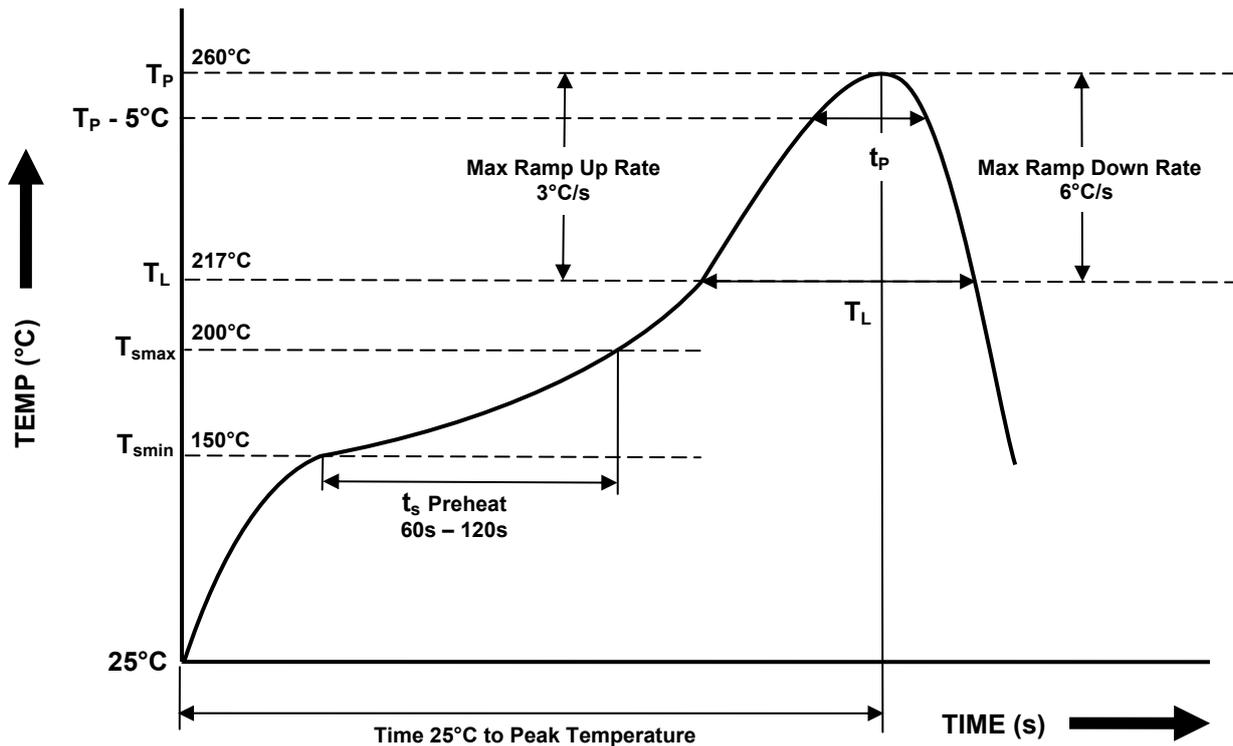
IS283

TAPE AND REEL PACKAGING



| Description | Symbol | Dimension mm (inch) |
|---|--------|------------------------|
| Tape Width | W | 12 ± 0.3 (0.47) |
| Pitch of Sprocket Holes | P_0 | 4 ± 0.1 (0.15) |
| Distance of Compartment to Sprocket Holes | F | 5.5 ± 0.1 (0.217) |
| | P_2 | 2 ± 0.1 (0.079) |
| Distance of Compartment to Compartment | P_1 | 8 ± 0.1 (0.315) |

IR REFLOW SOLDERING TEMPERATURE PROFILE
One Time Reflow Soldering is Recommended.
Do not immerse device body in solder paste.



| Profile Details | Conditions |
|---|--|
| Preheat - Min Temperature (T _{SMIN}) - Max Temperature (T _{SMAX}) - Time T _{SMIN} to T _{SMAX} (t _s) | 150°C 200°C 60s - 120s |
| Soldering Zone - Peak Temperature (T _P) - Time at Peak Temperature - Liquidous Temperature (T _L) - Time within 5°C of Actual Peak Temperature (T _P - 5°C) - Time maintained above T _L (t _L) - Ramp Up Rate (T _L to T _P) - Ramp Down Rate (T _P to T _L) | 260°C 10s max 217°C 30s max 60s - 100s 3°C/s max 6°C/s max |
| Average Ramp Up Rate (T _{smax} to T _P) | 3°C/s max |
| Time 25°C to Peak Temperature | 8 minutes max |



DISCLAIMER

Isocom Components is continually working to improve the quality and reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing Isocom Components products, to comply with the standards of safety in making a safe design for the entire system, and to avoid situations in which a malfunction or failure of such Isocom Components products could cause loss of human life, bodily injury or damage to property.

In developing your designs, please ensure that Isocom Components products are used within specified operating ranges as set forth in the most recent Isocom Components products specifications.

The Isocom Components products listed in this document are intended for usage in general electronics applications (computer, personal equipment, office equipment, measuring equipment, industrial robotics, domestic appliances, etc.). These Isocom Components products are neither intended nor warranted for usage in equipment that requires extraordinarily high quality and/or reliability or a malfunction or failure of which may cause loss of human life or bodily injury ("Unintended Usage"). Unintended Usage include atomic energy control instruments, airplane or spaceship instruments, transportation Instruments, traffic signal instruments, combustion control instruments, medical Instruments, all types of safety devices, etc... Unintended Usage of Isocom Components products listed in this document shall be made at the customer's own risk.

Gallium arsenide (GaAs) is a substance used in the products described in this document. GaAs dust and fumes are toxic. Do not break, cut or pulverize the product, or use chemicals to dissolve them. When disposing of the products, follow the appropriate regulations. Do not dispose of the products with other industrial waste or with domestic garbage.

The products described in this document are subject to the foreign exchange and foreign trade laws.

The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by Isocom Components for any infringements of intellectual property or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any intellectual property or other rights of Isocom Components or others.

The information contained herein is subject to change without notice.